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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,154	01/12/2006	Jeffrey Thomas Carter	118989-05072263	3341

20583 7590 01/12/2011

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EXAMINER	
LEONARD, MICHAEL L	
ART UNIT	PAPER NUMBER
1763	
MAIL DATE	DELIVERY MODE
01/12/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,154	CARTER ET AL.	
	Examiner	Art Unit	
	MICHAEL LEONARD	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7,9-26 and 29-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 7, 9-26, 29-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/14/2010 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 7, 9-26, and 29-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular, independent claims 1, 24, and 29 require at least one polyester polyol, consisting of a polyester formed from:

a) 60 to 100% by weight of dimer fatty acids, relative to the weight of the total weight of the dicarboxylic acids; and

b) 0 to 40% by eight of non-dimer fatty acids, relative to the weight of dicarboxylic acids….

These portions of the claims render claims 1, 24, and 29 indefinite because component (a) only lists dicarboxylic acids and fail to recite a hydroxy-functional reactant. Polyesters can not be produced from dicarboxylic acid alone and component

(b) is not reacted with (a) and because of the consisting of language there appears to be no other reactant (including alcohol component), therefore a polyester is not formed.

As to claims 7 and 32: The language “low molecular weight polyol component” and “ethylene glycol and/or propylene glycol" portion lacks antecedent basis. It is noted that claim 1 recites a polyester polyol, consisting of polyester formed from, however, there is not mention of a diol component when forming the polyester.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims 1-3, 7, 9-12, 14-20, 24-26, 29, 31, and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,610,811 to Westfechtel et al. in view of U.S. Patent No. 4,985,535 to Takada et al. and U.S. Patent No. 4,395,530 to Hammond and further evidenced by U.S. Patent No. 3,264,236 to Santaniello et al.

As to claim 1, Westfechtel discloses adhesives comprising A) polyol and B) isocyanate-terminated prepolymer. This prepolymer is the reaction product of (i) polyisocyanate and (ii) hydroxy-functional polyester based on diol and dimer fatty acid, wherein (i) and (ii) are present in an NCO:OH ratio of at least 2:1 (Column 2, lines 13-21; Column 4, lines 51-57, Column 6, lines 3-5). It is noted that the reaction of A) and B) fails to satisfy the claimed NCO:OH ratio, however, the reaction of (i) and (ii) satisfies

the claimed reaction product of claim 1. Moreover, claim 1 does not exclude additional components that would correspond to component A) of Westfechtel.

Westfechtel fails to disclose the NCO content of the final moisture-curable polyurethane adhesive.

However, Takada discloses moisture-curable hot melt adhesives wherein the NCO/OH ratio is 1.4 through 3.0 and Takaka goes on to teach that if the ratio is less than 1.4, the pot life of the resulting polyurethane prepolymer will be sacrificed (viscosity buildup) and if the ratio exceeds 3, the foaming resistance of the adhesive composition will be adversely affected (Column 5, lines 19-31). Furthermore, Hammond also teaches moisture-curable polyurethane prepolymer adhesives (Abstract) wherein the ratios of available active isocyanate (NCO) groups of the isocyanate to OH or other hydroxyl groups are critical to the achievement of the end adhesive properties so desired. Excess active isocyanate in the prepolymer will react with water available from atmospheric moisture or the moisture contained in the material to be bonded. The isocyanate will also react with nearly any compound having active hydrogen. Reaction with water gives carbon dioxide and urea compounds, which will further react to form biuret compounds, crosslinking the polyurethane adhesive to form a strongly bonding adhesive. It has been determined that the present process gives the best results with the polyurethane prepolymer having an excess of available NCO in amount of 5% to 20% by weight, which meets the claimed amount of NCO present in the adhesive.

Therefore, at the time of the invention it would have been obvious to a person of ordinary skill in the polyurethane adhesive art to use NCO:OH ratios of greater than 2

as disclosed by Westfechtel and Takada to form NCO terminated prepolymers with an excess of NCO of at least 5% by weight and up to 20% by weight as evidenced by Hammond in order to form a polyurethane adhesive with the desired final physical properties as evidenced by Takada with regards to foaming resistance and viscosity buildup (Column 5, lines 19-31) as well as hardness of the adhesive, commercial bonding, handling applications, adhesive properties, and flow properties as evidenced by Hammond (Column 6, lines 1-8). One of ordinary skill in the art would have arrived at the limitations of claim 1 since Westfechtel, Takada, and Hammond teach preferred NCO:OH ratios of the polyurethane prepolymers in order to arrive at final properties of the adhesive so desired and all three are related to analogous final products.

Furthermore, it is the examiner's position that the NCO:OH ratio is a result effective variables because changing them will clearly affect the type of product obtained. See MPEP § 2144.05 (B). Case law holds that "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In view of this, it would have been obvious to one of ordinary skill in the art to utilize the claimed ratios of Takada and Hammond to arrive at a final polyurethane prepolymer adhesive with the desired final properties based on the end use of the adhesive including those within the scope of the present claims so as to produce desired end results.

As to claim 2, although not explicitly disclosed by Westfechtel, the relied upon polyisocyanate would exhibit the claimed viscosity at 25°C since the polyisocyanate of example 1 are referred to as “liquid polyisocyanate” at "room temperature."

As to claim 3, as discussed above, Westfechtel discloses an adhesive comprising A) hydroxyl-functional polyester based on fatty acid, and B) isocyanate-terminated prepolymer (Abstract). Component B) is the product of polyisocyanate and hydroxyl-functional polyester that also contains units based on fatty acid (Column 3, lines 23-30). Although the reactants A) are disclosed, there is no mention as to what specific reactants are useful In the production of the hydroxyl-functional polyester for component B).

Nevertheless, one of ordinary skill would have arrived at the limitations of claim 3 since Westfechtel discloses for component A) what reactants are suitable for the production of hydroxyl-functional polyester based on fatty acids, and one of ordinary skill would be motivated to use the same reactants in the product of B) since it would yield a homogenous final product. With this understanding, the hydroxyl-polyester of A) is produced using dimers of C18 compounds (Column 2, lines 27-30).

Furthermore, Santaniello discloses isocyanate-terminated prepolymers prepared from polyisocyanates and dimers and trimers of C18 fatty acids such as oleic or linoleic acids (Column 1, lines 56-65, Column 2, lines 1-8). Santaniello further discloses that these prepolymers show a substantial improvement with respect to water absorbency, viscosity and curing temperatures (Column 1, lines 70-72). Thus, one of ordinary skill would be motivated to use the C18 fatty alkyl chains because of the substantial

improvement with respect to water absorbency, viscosity and curing temperatures (Column 1, lines 70-72) in the polyurethane prepolymers as evidenced by Santaniello.

As to claims 7, 33, and 34, with the rationale set forth above, Westfecthtel render obvious using diol such as ethylene glycol and/or propylene glycol (Column 3, lines 10-14). Furthermore, Santaniello discloses diethylene glycol (Example 1) and it would have been obvious to use such because they are useful for analogous polyurethane adhesive systems.

As to claims 9 and 11, with the rationale set forth above, Westfecthel teaches the polyester in A) has a hydroxyl number from 100 to 175 - which equates to a molecular weight of about 600 to 1,000. Therefore, it would have been obviou to use polyester diol having a hydroxyl number between 100 and 175 in B) since it is suitable value for dimer diol and the dimer diol is disclosed as being interchangeable with the polyesters.

As to claims 10 and 14-19, as discussed above, Westfechtel discloses an adhesive comprising isocyanate-terminated prepolymer, however, there is not mention of glass transition temperatures or mechanical properties. Nevertheless, the relied upon composition would inherently exhibit the same properties since it is based on identical reactants present in overlapping amounts.

As to claim 12, Hammond discloses isocyanate contents of between 5% and 20% by weight (Column 5, line 46).

As to claim 20, although Westfechtel fail to explicitly disclose the adhesive coating on a substrate, it would have been obvious to apply the adhesive to a substrat since this step is required when bonding various materials.

As to claims 24, 26, and 29, although Westfechtel teach the viscosity of the prepolymers listed on column 4, lines 51-57, similar to the discussion set forth above, said prepolymer would inherently exhibit the same viscosity as claimed since it is based on identical composition.

As to claim 25, Westfechtel discloses that the prepolymer may further comprise unreacted polyisocyanate (Column 5, lines 9-10).

As to claim 31, Westfechtel discloses that the polyester polyol may be produced by reacting diol with dimer fatty acid or trimer fatty acid, i.e. the fatty acid may be 100% dimer (Column 4, lines 55-57).

Claims 4, 13, 23, 29-32, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,610,811 to Westfechtel et al. in view of U.S. Patent No. 4,985,535 to Takada et al. and U.S. Patent No. 4,395,530 to Hammond and further evidenced by U.S. Patent No. 3,264,236 to Santaniello et al. that has been explained above and is applied here as such in view of JP-2003-013032 to Tetsuo et al.

As to claims 4, 13, 23, 29-30 and, 32 Westfechtel discloses B) isocyanate-terminated prepolymer that is the reaction product of (i) polyisocyanate and (ii) hydroxyl-functional polyester, wherein (ii) is based on dimer and trimers of fatty acid, however, Westfechtel fails to disclose the full claimed range of dimer/trimer.

Tetsuo discloses moisture-curable adhesive comprising polyurethane that is the reaction product of polyisocyanate and hydroxyl-functional polyester, wherein said polyester is based on dimer and trimer fatty acid (Abstract, Paragraph 11). It is

preferred that the dimer is present by at least 70 weight% and the trimer is present by at most 20 weight% since these amounts prevent unwanted gelling (Paragraph 12). Therefore, it would have been obvious to arrive at the claimed dimer/trimer ranges because they yield polyester having a viscosity desirable for liquid, moisture curable polyurethane adhesive.

As to claim 31, Westfechtel discloses that the polyester polyol may be produced by reacting diol with dimer fatty acid or trimer fatty acid, i.e. the fatty acid may be 100% dimer (Column 4, lines 55-57).

Claims 21 and 22, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,610,811 to Westfechtel et al. in view of U.S. Patent No. 4,985,535 to Takada et al. and U.S. Patent No. 4,395,530 to Hammond and further evidenced by U.S. Patent No. 3,264,236 to Santaniello et al. that has been explained above and is applied here as such in view of U.S. Patent No. 5,994,493 to Krebs.

As to claims 21 and 22, as previously discussed, Westfechtel discloses moisture-curable adhesives comprising isocyanate-terminated prepolymer that is the reaction product of polyisocyanate and hydroxyl-functional polyester wherein said polyester comprises dimers of fatty acid. However, Westfechtel fails to disclose wood substrates as a suitable bonding material.

Krebs also discloses moisture-curable adhesives comprising isocyanate-terminated prepolymer that is the reaction product of polyisocyanate and hydroxyl-functional polyester wherein said polyester comprises dimers of fatty acid (Abstract,

Column 4, lines 23-39, Column 5, lines 41-46). Moreover, Krebs discloses that the adhesive is useful in bonding to wood, specifically wood fiber molds - which is taken to satisfy the "cladding" material of claim 22.

Therefore, it would have been obvious to arrive at the limitations of claims 21 and 22 since Krebs discloses wood as a suitable bonding material for adhesives comprising analogous moisture curable isocyanate-terminated prepolymers.

Response to Arguments

Applicant's arguments with respect to claims 1-4, 7, 9-26, and 28-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LEONARD whose telephone number is (571)270-7450. The examiner can normally be reached on Mon-Fri 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Milton I. Cano/
Supervisory Patent Examiner, Art Unit 1763

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